1 PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

This environmental assessment (EA) is prepared pursuant to the National Environmental Policy Act (NEPA). The action proposed is to continue current cooperative wildlife hazard management assistance to ensure aviation safety at [redacted] in the state of Hawaii. This analysis does not include every airport in Hawaii, but only those airports that have had wildlife hazard problems that have received some form of operational assistance from the United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (WS) when requested by the [redacted].

This analysis does not include cooperative WS operations at [redacted] Airport, which were analyzed under separate environmental assessments for each airport. There are no WS operations at [redacted] Airport. The criteria for individually analyzing an airport project were the size of airport operations or the type and intensity of WS actions.

The WS program uses an Integrated Pest Management (IPM) approach in which a variety of methods may be used or recommended to prevent or reduce wildlife hazards to aviation. IPM is described in Appendix J of Animal Damage Control (ADC) Program Final Environmental Impact Statement (EIS) (USDA 1995).

The WS program provides an integrated wildlife control program at airports and surrounding areas to reduce wildlife hazards to aircraft. Lethal methods include shooting and trapping introduced wildlife species on the airfield and at key roost and rookery locations. Non lethal wildlife strike prevention techniques include trapping and relocation, hazing using pyrotechnics, driving, walking (for all species but especially endangered bird species, as permitted), use of exclusion devices, barriers, visual and audio deterrents and decoying migratory shorebirds from high risk areas.

The objective of the WS operations at airports is to reduce wildlife through the most appropriate combination of methods, thereby protecting human lives and property through an integrated wildlife hazard management program.

1.2 NEED FOR ACTION

1.2.1 Overview of Wildlife Hazards to Aviation - General

Wildlife-aircraft strike hazards are a major concern to aviation in the United States. It costs the airline industry and the military about $250 million annually. The threats to human safety and the damage caused to aircraft by wildlife at airports requires that wildlife management on and around airports be an integral part of airport safety and management.

The Federal Aviation Administration (FAA 1998) reported 16,949 bird and mammal strikes in the United States from 1991 to 1997. Between 1991 and 1997 there was a 53 percent increase in the number of strikes reported annually. Analysis of strike reports from three major U.S. airports showed that less than 20 percent of all strikes occurring at these airports were reported to the FAA. The reporting trend is similar for Hawaii. Hawaii ranked 15 in total number of bird strikes among other states, with 360 reported strikes during the seven year period.

1.3 CURRENT PROGRAM

1.3.1 General Integrated Pest Management Strategy

The most effective approach to resolving wildlife damage problems is to integrate the use of several methods, either simultaneously or sequentially. Integrated Pest Management as used in the WS program, is the integration and application of practical methods of prevention and control to reduce damage by wildlife while minimizing harmful effects of control measures on humans, other species, and the environment. The IPM approach used by the WS program consists of three action approaches: 1) management of the resource being negatively affected, 2) management of the wildlife responsible for, or associated with the damage, or 3) physical separation of the two. Resource management includes alteration of cultural practices, habitat modifications, and alteration of human behavior. Management of the wildlife includes behavior alteration through harassment or scaring and population manipulation through translocation or lethal removal. Physical separation may consist of fencing, netting, or other barriers.

Selection of the appropriate approach and method is the result of applying the standard WS decision making process. The WS Decision Model (USDA 1995) is a version of the general professional action model and is applied to all WS operations. The problem is first identified, then a determination is made if the assistance requested is within existing authorities and abilities. Impacts of the problem are considered, and an assessment is made of the actions potentially applicable to the particular situation. This is followed by selection and implementation of those methods or approaches most appropriate. This process concludes with an assessment of the effectiveness of the actions to determine if additional treatment is required.

1.3.2 Interagency Coordination

Resident wildlife species are under the management authority of the State of Hawaii Department of Land and Natural Resources (HDLNR). WS is issued a Protected Wildlife Permit from HDLNR each year, which specifies the species, locations and methods approved to conduct wildlife damage control operations. Terms of the permit are negotiated with HDLNR. Additionally, WS may request a Wildlife Control Permit from a district biologist of HDLNR for specific projects on each island. Monthly reports of animals taken under each permit are submitted to HDLNR.

Migratory birds are under management authority of the FWS. Wildlife Services coordinates all actions on native migratory birds with the FWS.

1.3.3 Wildlife Services Program in Hawaii

1.3.3.1 [redacted] Airport

WS began cooperative bird-strike hazard control operations under cooperative agreement with [redacted] in 1986. The operations were a continuation of bird control activities initiated by the U.S. Fish and Wildlife Service (FWS) from December 1985. The objective of the operations was to reduce the estimated population of 2,000 cattle egrets (*Bulbulcus ibis*) that flew across [redacted] Airport twice daily as they moved between their rookery at [redacted] and upland feeding sites. Control operations at [redacted] and upland sites reduced the egret population to perhaps two dozen birds. There is an occasional influx

of egrets, possibly from Maui, that may enlarge the number, but through an ongoing control program, WS has kept the population to the low twenties. WS does not control bird-strike hazards directly on the airfield at [redacted]. The airport manager conducts routine bird control operations on the airport property.

The number of cattle egrets remaining in [redacted] represents most of the population on the Island of Hawaii. In calendar years 1996 and 1997 no cattle egrets were taken by WS on the island of Hawaii. The remnant population in [redacted] continues to roost at [redacted] but no longer flies over the Airport. WS monitors the egret numbers through direct observations and through reports from the public. On occasion WS will shoot cattle egrets at their roost in [redacted]. A sound suppressed .22 caliber rifle fitted with a scope is used. Operations are conducted in the late afternoon and evening after the egrets have settled down to roost. The shooting may be from inside a truck parked off the main road. Usually, the actual shooting lasts no more than 30 minutes since the egrets leave after only a few shots.

Actions for [redacted] Airport were categorically excluded from further NEPA analysis on September 3, 1997. In 1998, a determination was made to include [redacted] Airport in this analyses that examines WS actions on the environment for all operations at small airports in the State of Hawaii.

1.3.3.2 [redacted] Airport

[redacted] Airport is a small airport located at [redacted]. Since 1994, only six site visits were made by WS personnel. Gray francolins (*Francolinus pondicerianus*) and Pacific golden plovers (*Pluvialis fulva*) have the potential for creating hazards to the small passenger aircraft that service the resort community. Airport personnel may request WS operational assistance to deal with problematic wildlife hazard issues, but so far no requests for assistance have been made.

1.3.3.3 [redacted] Airport

[redacted]Airport is a small airport on [redacted] serving inter island air carriers. WS provided assistance to remove nesting birds from buildings. There had been no wildlife hazards to aviation identified at [redacted]until June 1998, when the airport requested WS assistance to remove cattle egrets that began to feed in the runway grasses. The change in feeding patterns was attributed to the cessation of farming in fields surrounding the airport. WS conducted a week-long control operation, shooting 51 cattle egrets on the airfield to condition the population to stay clear of the airfield.

1.3.3.4 [redacted] Airport

[redacted] Airport is just outside [redacted] on the island of [redacted]. WS personnel on the island of Maui provide operational assistance to the airport on [redacted]upon request. In 1997 WS personnel were requested to control ring-necked pheasants (*Phasianus colchicus*) and gray francolins at [redacted]Airport due to a higher than normal population. Hay cultivation adjacent to the airport provided habitat for turkey (*Meleagris gallapavo*), ring-necked pheasants and gray francolins. Pheasants have collided with aircraft on a number of occasions. [redacted]Airport also reported common barn owls (*Tyto alba*) in collisions with aircraft.

1.3.3.5 [redacted] Airfield

[redacted] Airfield is located on the island of [redacted]. It is open to civil aircraft for daylight hours. At night, the U.S. Army may conduct helicopter training operations. Extensive commercial glider operations and sky diving occur daily. In 1987 WS was requested to assist [redacted]in preventing Laysan albatrosses (*Diomedia immutabilis*) from establishing a nesting colony on the airfield. WS implemented the Laysan Albatross Abatement Plan which is an overall attempt by a number of federal and state agencies to deal with the problem of albatrosses colonizing airfields on the main Hawaiian Islands. The large seabirds are a threat to flight safety and attempts to nest on the airfield became a growing problem. Laysan albatross also attempt to nest at [redacted] and the [redacted]. During the Laysan albatross nesting season (October to July), a WS specialist is assigned to [redacted] to prevent Laysan albatrosses from nesting and

courting. New birds are captured, marked and released. Previously marked birds are hazed after color band records are taken. If nests are found, eggs are removed and donated to the University of Hawaii, School of Medicine for research use.

1.3.3.6 [redacted]

[redacted] is located in [redacted] near the town of [redacted] on [redacted]. It is a general aviation airfield serving helicopter and glider aircraft. It is not staffed by airport or WS personnel. WS out of [redacted] Airport may conduct operational assistance in the form of hazing and shooting if there is a buildup of bird numbers. Species such as cattle egret, ring-necked pheasant, and feral chickens have been controlled at [redacted] by WS at the request of the airport district manager.

1.3.3.7 [redacted] Airport

[redacted] Airport serves a small resort community on Kauai. Cattle egrets, red jungle fowl (*Gallus gallus*), and pheasants are potential bird hazards to aviation. WS is on an on-call status, with personnel working out of [redacted] Airport. No requests for assistance have been made.

1.3.3.8 [redacted] Airport

[redacted] Airport is a unmanned airfield, that serves the settlement on [redacted], Molokai. WS has provided technical assistance to the Airports Division on ways to manage aviation hazards from axis deer and feral pigs that forage along the runways. Fencing has been suggested and training has been given to airport personnel in the use of pyrotechnics to haze deer. Feral pigs may be removed by WS when requested.

1.3.4 Decision to be Made

Based on Agency relationships and legislative mandates, WS is the lead agency for this EA, and therefore responsible for the scope, content, and decisions made. [redacted], HDLNR and FWS have had input throughout the EA preparation to ensure that there is an interdisciplinary approach to complying with NEPA, agency mandates, policies or regulations.

The decisions to be made are:

How can WS best respond to wildlife hazards at airports?
Should the program be implemented in an expanded format in the state?
Would there be any significant impact on the environment?

1.3.5 Scope of this Environmental Assessment Analysis

This EA is tiered to the WS programmatic Environmental Impact Statement (USDA 1994). This EA analyzes the proposed action and alternatives of WS providing operational assistance to control wildlife hazards at [redacted] on islands of Hawaii, Maui, Lanai, Molokai, Oahu and Kauai. This analysis does not include cooperative WS operations at [redacted] Airport, which were analyzed under separate environmental assessments for each airport. The criteria for individually analyzing an airport project were the size of airport operations or the type and intensity of WS actions. The analysis does not cover operations conducted on behalf of federal cooperators. Federal cooperators are considered the responsible agency for NEPA requirements.

1.3.5.1 Period for which this EA is Valid

This EA will remain valid until WS and other appropriate agencies determine that new needs for action, changed conditions, or new alternatives having different environmental effects must be analyzed. At that time, this analysis and document will be supplemented pursuant to NEPA. Review of the EA will be conducted annually to ensure the EA is sufficient.

1.3.5.2 Site Specificity

This EA addresses all airport sites mentioned in the introduction as well as adjacent sites harboring wildlife populations that affect the airports. This EA emphasizes issues as they relate to specific areas whenever possible; however, many issues apply wherever wildlife damage and resulting management occur, and are treated as such. The standard WS Decision Model (USDA 1994) and WS Directive 2.201 will be the site-specific

procedure for NEPA compliance for individual actions conducted by WS in the state. Many site-specific actions may be categorically excluded from further NEPA documentation by APHIS NEPA implementing regulations.

1.3.5.3 Actions Analyzed

This EA evaluates ongoing and temporary projects as the types of actions that prevent or control wildlife hazards to aviation at [redacted] on the islands of Kauai, Oahu, Molokai, Lanai, Maui, and Hawaii.

1.4 AUTHORITY AND COMPLIANCE

1.4.1 WS Legislative Authority

The primary statutory authority for the WS program is the Animal Damage Control Act of 1931 as amended, (7 U.S.C. 426-426c; 46 STAT. 1468) which provides that: The U.S. Department of Agriculture, Animal and Plant Health Inspection Service, WS (formerly ADC) program is directed by law to protect American agriculture and other resources from damage associated with wildlife. In 1988, Congress strengthened the legislative mandate of WS with the Rural Development, Agriculture, and Related Agencies Appropriations Act (P.L. 100-202) which authorizes the Secretary of Agriculture to enter into agreements to control nuisance mammals and birds.

1.4.2 Compliance with Federal Law

1.4.2.1 National Environmental Policy Act

NEPA requires that federal Agencies consider the impacts of their decisions on the environment. This document follows Animal and Plant Health Inspection Service Implementing Procedures for NEPA.

1.4.2.2 Endangered Species Act (ESA)

It is WS (WS Directive 2.310) and Federal policy, under the Endangered Species Act (ESA), that all Federal agencies shall seek to conserve

threatened and endangered species and shall utilize their authorities in furtherance of the purposes of the Act (Sec. 2(c)). WS conducts Section 7 consultations with the FWS to utilize the expertise of the FWS to ensure that "any action authorized, funded or carried out by such an agency...is not likely to jeopardize the continued existence of any endangered or threatened species..." (Sec. 7(a)(2)).

1.4.2.3 Migratory Bird Treaty Act

The Migratory Bird Treaty Act provides the FWS regulatory authority to protect birds that migrate. WS informs FWS of activities to conduct control operations on Migratory Birds.

1.4.2.4 Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

FIFRA requires the registration, classification, and regulation of all pesticides used in the United States. The Environmental Protection Agency (EPA) is responsible for implementing and enforcing FIFRA. All chemicals used or recommended by the WS program in Hawaii are registered with and regulated by both the Federal EPA and DOA. WS uses the chemicals according to labeling procedures and requirements as regulated by the EPA and DOA (WS Directive 2.401).

1.4.2.5 National Historic Preservation Act (NHPA) of 1966 as amended

The NHPA requires: 1) Federal agencies to evaluate the effects of any Federal undertaking on cultural resources, 2) consult with the State Historic Preservation Office regarding the value and management of specific cultural, archaeological and historic resources. The nature of the activities analyzed in this EA does not affect sites covered under the NHPA.

1.4.3 Federal Aviation Administration Memorandum of Understanding

A Memorandum of Understanding (MOU) with the Federal Aviation Administration (FAA) was signed in 1989 that establishes a cooperative relationship between FAA and Wildlife Services for resolving wildlife hazards to aviation that benefits public safety. FAA circulars advise airport operators to contact Wildlife Services for advice on how to handle wildlife hazards.

1.5 ISSUES

The issues that have been identified as important to this analysis are:

Issue 1: The effectiveness of the WS operations to protect wildlife hazards to aviation.
Issue 2: Impacts on federal and state listed threatened and endangered animals and plants and those proposed for listing.
Issue 3: Impacts on migratory birds.
Issue 4: Humaneness of techniques.
Issue 5: Impacts on target/non target species.

2 ALTERNATIVES

2.1 DESCRIPTION OF ALTERNATIVES

2.1.1 Alternative 1 - Current Program (No Action)

The No Action alternative is a procedural NEPA requirement (40 CFR 1502.14(d)), it is a viable alternative that could be selected, and serves as a baseline for comparison with other alternatives. This alternative embraces the current program as described in Section 1.3 of this document and includes both ongoing and temporary projects. WS may enter into new agreements but the program would be similar. The No Action Alternative, as defined here, is consistent with the Council on Environmental Quality (CEQ) definition (CEQ 1981).

2.1.2 Alternative 2 - No WS Operational Program - Technical Assistance Only

This alternative would terminate the WS program to control wildlife hazards to aviation at small airports in Hawaii, but would allow WS to provide technical assistance and make recommendations when requested. Examples of technical assistance may include providing training on bird identification and demonstrations on how to use various scare techniques to haze wildlife when they pose a hazard to aviation. Under this alternative, [redacted] could carry out the control work under permit by the FWS, if migratory birds were involved, and HDLNR if other birds were involved.

2.1.3 Alternative 3 - Non-Lethal Before Lethal Control Program

The Non-Lethal Before Lethal Control Program alternative would require the use of all practical non lethal methods prior to WS recommending or using lethal controls to resolve wildlife hazards at airports and airfields. Other than the requirement to try non-lethal methods first, this alternative is similar to Alternative 1.

2.1.4 Alternative 4 - Expanded WS Program to Protect Aviation Safety

The expanded program would include all aspects of the current program with the addition of staff to increase the presence of WS personnel at the airports and inclusion of operations to more effectively serve the future needs of the airports and airfields on all the islands. Control methods would be similar but operations would be expanded to more intensively manage wildlife populations at each location. The expansion of the current WS program would be dependent upon the need of such services and funding support by [redacted] or other agencies.

3 ENVIRONMENTAL CONSEQUENCES

This section analyzes the environmental consequences using Alternative 1 (the current program) as the baseline for comparison with the other alternatives to determine if the real or potential impacts are greater, lesser, or the same.

The following resources within the state of Hawaii would not be significantly impacted by any of the alternatives analyzed: soils, geology, minerals, water quality/quantity, wetlands, visual resources, air quality, aquatic resources, and historical sites. Impacts on these resources will not be analyzed further.

3.1 ENVIRONMENTAL JUSTICE

This action would be in compliance with Executive Order 12898 to ensure Environmental Justice. It is not anticipated that the proposed action would result in any adverse or disproportionate environmental impacts on minority and low-income persons or populations.

3.2 CUMULATIVE AND UNAVOIDABLE IMPACTS

This EA recognizes that the total annual removal of individuals from wildlife populations by all causes is the cumulative mortality. The WS operational program to protect aviation safety at small airports, statewide is not likely to result in any significant adverse cumulative impacts on target and non target animals (including threatened and endangered species). The removal of individuals from a wildlife population, to prevent damage to property and threats to health and safety does not adversely affect the population. Generally the reason that a wildlife species becomes a pest is due to high inherent reproductive and adaptive capabilities. The recruitment and a species ability to adapt to the human environment ensures the population survival, and minimizes the effects of the annual removal of individuals to protect property and ensure flight safety. The cumulative impacts on target species is discussed under Impacts on Target Species.

3.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The WS operational program to protect aircraft and ensure flight safety statewide will require minor commitments of fossil fuels and electrical energy for motor vehicles and office support. These uses will produce negligible impacts on the supply of fossil fuels and electrical energy.

3.4 ISSUES ANALYZED IN DETAIL

3.4.1 Alternative 1 - Continue the Current Program (No Action)

3.4.1.1 Issue 1 - Effectiveness

The current program satisfies the immediate need to reduce or eliminate damage and safety threats from wildlife at these airports. WS responds to requests from the [redacted] to provide assistance on an ad hoc basis. Most problems with hazards are resolved

after one or two visits, therefore no longer term operational assistance has been necessary.

3.4.1.2 Issue 2 - Impacts on threatened and endangered species.

No threatened or endangered species are encountered at [redacted].

On occasion WS will shoot cattle egrets at their roost in [redacted] as part of the cooperative agreement with [redacted] Airport. [redacted] is a private freshwater pond near the airport. A sound suppressed .22 caliber rifle fitted with a scope is used. Usually, the actual shooting lasts no more than 30 minutes since the egrets leave after only a few shots. Because the shooting is silent there is virtually no disturbance to the small population of federally listed endangered Hawaiian coots (*Fulica alai*) that inhabit the pond. After consultation with the FWS, WS agreed to incorporate a nest reconnaissance by a competent person to search for coot nests in the vicinity of the roost tree before each shooting operation. If nests are found, WS cancels the operation until nesting is completed. If no nests are found, the shooting operation commences.

3.4.1.3 Issue 3 - Impacts on Migratory Birds

Some introduced birds such as cattle egrets have federal migratory bird status, but are considered alien to the islands. In the event that native migratory birds, such as Laysan albatrosses are subject to WS actions, IPM non lethal methods are usually considered sufficient in dealing with indigenous species. In order to discourage Laysan albatrosses from nesting on [redacted], WS has employed a Laysan Albatross Abatement Plan where birds are banded and hazed from the airfield in an attempt to preclude nesting. The plan was reviewed by the HDLNR and FWS. If nesting occurs, the eggs are taken, and the adult hazed away. The eggs are used in medical research, however, the number of eggs taken is small and does not affect the population of Laysan albatrosses in the Hawaiian archipelago. Attempts to hatch the eggs after the research and release fledgling albatrosses were made but proved to be extremely costly and resulted in poor survival of fledglings. More aggressive actions taken to preclude nesting early in the season were found to be the best solution to

the problem of dealing with chicks (Table 1). No albatrosses are killed or have ever been killed as part of any WS operations to control the birds at civilian and military airfields in Hawaii.

The introduced migratory birds that may establish a commensal relationship with humans may require IPM approach that also incorporates lethal removal. Cattle egrets were introduced to Hawaii and are year- round residents, but their legal status is migratory. The limited take of cattle egrets from the airports or at [redacted] and surround areas around [redacted] Airport do not affect the state wide population, although the take around [redacted] is designed to maintain zero population (Table 2).

Both Laysan albatrosses and the introduced cattle egret populations are considered abundant and any take of individuals would not have a significant negative impact on the populations. WS coordinates activities on migratory birds with HDLNR and FWS.

Table 1. Laysan albatross hazard control at [redacted] from 1993-1997 nesting season conducted by WS.

Methods	1993	1994	1995	1996	1997	Total
Eggs Removed	1	0	0	0	0	1
Adults Captured/Banded/Released	56	15	14	1	8	94
Harass by Shooting		14	5			19
Harass by Pyrotechnics		68	116	91	253	528
Harass by Vehicle		30	73			103

3.4.1.4 Issue 4 - Humanness of Techniques

The issue of humaneness, as it relates to the killing or capturing of wildlife is an important but very complex concept that can be interpreted in a variety of ways. Humaneness is a person's perception of harm or pain inflicted on an animal, and people may perceive the humaneness of an action differently. Some individuals and groups are opposed to some of

the management actions of WS, especially lethal methods. However, it is concluded that the most effective and expeditious methods must be used to handle wildlife conflicts. WS personnel are experienced and professional in their use of management methods so that they are as humane as possible.

3.4.1.5 Issue 5 - Impacts on Target Species

The impact of the program on target species from ongoing projects during a 5.5 - year period is listed in Table 2. These numbers are not significant on the overall population of any of the species because of the high reproductive and recruitment rates. WS reports all take of resident birds to HDLNR and migratory bird take to FWS. These agencies have management authority over resident and migratory wildlife.

Table 2. Target animals killed to control wildlife hazards at Hawaii's airports January 1993 to July 1998.

Ongoing Projects	Species	1993	1994	1995	1996	1997	1998	Total
[redacted] Airport	Cattle Egret						51	51
[redacted] Airport	None							
[redacted] Airport	Ring-necked Pheasant					12		12
	Gray Francolin					6		6
[redacted]	Cattle Egret	11		9				20
[redacted]	Laysan albatross Eggs	1						1
[redacted] Airport	None							
[redacted]	None							

3.4.2 Alternative 2 - No Federal WS Operational Program - Technical Assistance Only

Under this alternative, operational wildlife damage management would be

conducted by the [redacted]R or their agent. WS would provide the technical assistance to support the [redacted] or a third party if requested. This alternative retains most of the elements of the Current Program Alternative, but the work would be conducted by [redacted] or a third party. The effectiveness of the alternative could be similar to the Current Program Alternative if methods and control devices are applied by personnel with the same technical expertise and professional oversight capabilities as the WS program. This may not always be possible for [redacted] and may result in higher environmental costs to achieve protection of property and ensure aviation safety. The impacts to migratory birds, target and non-target species and the issue of humaneness may be higher than the Current Program Alternative. WS employs wildlife biologists to manage the program and has a research arm dedicated to developing effective and humane methods of wildlife control. WS as a federal agency is also subject to the Government Performance and Results Act of 1993, which requires that federal agencies establish standards measuring their performance and effectiveness. The GPRA is another mechanism whereby WS is held accountable to maintain an effective program. Under Section 7 of the Endangered Species Act, federal agencies, such as WS, must consult with the FWS if any proposed actions will impact threatened and endangered species.

3.4.3 Alternative 3 - Non-Lethal Before Lethal Control Program

The Non-Lethal Before Lethal Control Program alternative is a modification of the present WS program that would require the use of all practical non lethal methods prior to WS recommending or using lethal controls to resolve wildlife hazard problems. Ultimately, both non lethal and lethal controls would be used under a modified Integrated Pest Management program.

The requirement to use non lethal methods before lethal methods tends to be counter intuitive to some service recipients. Often the service recipient needs the immediate problem solved while non lethal methods are established as part of a long-term solution. In some cases, not only would lethal before non lethal be more effective, it could also increase the chance of the successful implementation of non lethal techniques.

3.4.4 Alternative 4 - Expanded WS Program to Protect Aviation Safety

The expanded program would include all aspects of the current program with the addition of staff and inclusion of operations to more effectively serve the future

needs of the airports on all the islands. Control methods would be similar but operations would be expanded. The expansion of the current WS program would be dependent upon the need of such services and funding support by the airports. The alternative may prove to be more effective in alleviating even the slightest potential for a strike to occur. The issue of humaneness would be similar to the current program. Impacts to target, non target and migratory species may increase with an expanded WS program, however, due to integrated nature of the program, lethal take may not necessarily increase. Impacts to threatened and endangered species may not increase with this alternative since only one project, [redacted] [redacted]Airport, is conducted in a wetland site where interactions with Hawaiian coots is possible.

4 CONCLUSION

The action proposed by this environmental assessment is the current program alternative which would allow the types of operations at each airport covered under in this analysis.

5 PERSONS CONSULTED

Administrator
Department of Land and Natural Resources
Division of Forestry and Wildlife

Field Supervisor
U.S. Fish and Wildlife Service
Ecological Services

State Historic Preservation Officer
State of Hawaii
Historic Preservation Office

[redacted]

6 LIST OF PREPARERS

James G. Murphy

Reviewer
District Supervisor
USDA-APHIS-WS, Honolulu, HI.
B.S. Zoology, University of Hawaii.

Tim J. Ohashi
Primary Writer
Assistant State Director
USDA-APHIS-WS, Honolulu, HI.
B.S. Wildlife Resources, University of Idaho
M.S. Wildlife Biology, New Mexico State University at Las Cruces

J. Gary Oldenburg
Reviewer
State Director
USDA-APHIS-WS, Olympia, WA.
B.S. Fisheries and Wildlife Management, Oregon State University

Shannon Starratt
Editor
Environmental Management Coordinator
USDA-APHIS-WS, Portland, OR.
B.S. Animal Science, Virginia Polytechnic Institute
M.S. Agriculture, California Polytechnic State University

7 LITERATURE CITED

Federal Aviation Administration (FAA). 1998. Wildlife strikes to civil aircraft in the United States 1991-1997. Office of Airport Safety and Standards. Wash. D.C.

USDA 1995. Final Environmental Impact Statement. USDA, APHIS, WS Operational Support Staff, 6505 Belcrest RD, Room 820 Federal Bldg., Hyattsville, MD 20782.

USDA. 1998. Management Information System. USDA, APHIS. WS. Olympia WA.

Linnell, M.A., M.R. Conover and T.J. Ohashi. 1996. Analysis of bird strikes at a tropical airport. J. Wildl. Manage. 60(4):935-945